

REMARKS

Claims 1-22 are currently pending. Claim 19-22 have been newly added. Support for new claims 19-22 may be found in the specification as originally filed, for example, at page 24, lines 8-13, page 14, lines 6-8, page 18, lines 9-12 and original claims 7 and 9.

I. The Election/Restriction

The Examiner has maintained the restriction requirement.

However, the Examiner has not addressed the traversal that the two groups have already been searched.

II. The Rejection Based on Kurata et al ‘924

Claims 1-11 are rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Kurata et al. (US2008/0003924).

Kurata et al ‘924 is available as prior art under 35 U.S.C. § 102(e) as of the filing date of the divisional application 10/513,002 of October 29, 2004. Kurata et al ‘924 is not available as prior art under 35 U.S.C. § 102(e) as of the filing date of the International Application PCT/JP03/05464 because PCT/JP03/05464 was not published in English.

Applicants effective filing date is May 29, 2003, the filing date of International Application PCT/JP03/06769, which is earlier than the date of Kurata et al ‘924 as a reference.

Therefore, Kurata et al ‘924 is not available as prior art against the instant application and withdrawal of the rejection based on Kurata et al ‘924 is requested.

III. The Rejection Based on Yoneda et al.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Yoneda et al. (US 2007/0045233).

The present application relates to a polishing slurry that can polish barrier metals while suppressing effectively the etching of the copper wiring, by regulated pH of the polishing slurry and regulated pKa of the oxidized metal dissolving agent. Applicants respectfully submit that the present invention is not anticipated by or obvious over the disclosures of Yoneda et al and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

First of all, Applicants submit that the polishing liquid of Yoneda does not contain a metal anticorrosive agent. Yoneda describes in [0005] a conventional polishing liquid containing benzotriazole that formed so rigid the protective film that the polishing speed was insufficient. That is, the effects of benzotriazole are excessive and therefore insufficient. Thus, Yoneda has found a use of the specific compound such as formula (II).

Yoneda also described that comparative example III-5 containing benzotriazole did not progress the polishing.

Accordingly, Yoneda teaches away from using benzotriazole as metal anticorrosive, as in the present application.

Further, the polishing slurry of the present application is capable of polishing barrier metals. On the other hand, the polishing liquid of Yoneda is not used polish barrier metals, but rather wiring metals such as copper.

Further, Yoneda does not disclose or suggest polishing of tantalum compounds or titanium compounds as in new claim 19. See also new claim 22.

Further to the pKa, the description concerning the pKa in [0030] of Yoneda relates to pKa of not organic acid, but “hydroxy group-containing compound” contained in Yoneda's polishing liquid instead of metal anticorrosive agents. To begin with, Yoneda's “hydroxy group containing compound having pKa of 8 or more” in the range of pH 3 to 4 of the present application does not have the effect as the oxidized metal dissolving agent, since it actually does not dissociate much in such low range of pH.

The concrete examples of organic acid are described in [0040] of Yoneda and are shown regardless of whether each organic acid has pKa of at least 3.5 or not. There is no motivation or reason to select an organic acid having a specific pKa range, for instance at least 3.5, from the disclosure of Yoneda.

The new dependent claims.

In Comparative example 1-4 the polishing liquid of Yoneda comprises benzotriazole, hydrogen peroxide, and gluconic acid having Pka of 3.86 (http://en.wikipedia.org/wiki/Gluconic_acid), and pH of the polishing liquid is 4.0. New claim 20 recites a pH within the range of 3 to 3.75.

Comparative example 1-4 comprises fumed silica and [0119] of Examples of Yoneda discloses that primary particle size of fumed silica was 50 nm. However, the “particle diameter” in the present application is measured by optical diffraction scattering particle size distribution meter. Thus the “particle diameter” in the present application means not primary diameter, but aggregate diameter in liquid. Generally, the aggregate diameter of fumed silica is far larger than primary particle diameter. The inventors submit that they do not know of any fumed silica

having aggregate diameter (particle diameter) of 200nm or less. The Description of the present application discloses in p.18 “the average particle diameter of 100 nm or less which increases the polishing rate of the barrier layer is more preferable”. It is considered that fumed silica having such large particle diameter will decrease the polishing speed of the barrier layer such as Ta. See new claim 21 which recites an average particle diameter to 100 nm or less.

Comparative example II-9 of polishing liquid of Yoneda has pH of 7.6 and comprises Hydrogen peroxide of 4%. It is considered the polishing liquid of such high pH are not effective to polish barrier metals such as Ta.

Applicants traverse the Examiner's apparent taking of Official Notice regarding claims 5, 10 and 11. The compounds chosen for a polishing slurry depend on the object to be polished. Therefore, it cannot be said that the compounds disclosed in claims 5, 10 and 11 are well-known features as used in Applicants' claimed invention.

For the above reasons, it is respectfully submitted that the subject matter of Applicants' claims is neither taught by nor made obvious from the disclosures of Yoneda et al and it is requested that the rejection under 35 U.S.C. §103(a) be reconsidered and withdrawn.

IV. Conclusion

In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the rejection under 35 U.S.C. §102 and the rejection under 35 U.S.C. §103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

Application No. 10/517,049
Attorney Docket No. 043062

Amendment under 37 C.F.R. §1.111

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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